EXHIBIT 2

Expert Analysis and Report

June 20, 2017

Tyler Snow
Christensen & Jensen
257 East 200 South, Suite 1100
Salt Lake City, Utah 84111

RE: Barben v. Federal

Dear Mr. Snow,

As you have requested, I have reviewed and examined various documents, exhibits and testing results concerning the above referenced matter. Based on my education, work experience, knowledge and training, I intend to offer the opinions stated in this report. My opinions have been formulated to a reasonable degree of scientific certainty based on the facts gathered from pleadings, discovery responses, depositions, expert reports, my investigation of the subject ammunition, my review of the case materials and my testing. I have utilized data from standards and my own testing. I applied scientific and engineering methods to the facts, calculations and data to form my conclusions.

Qualifications

I am currently the Product Safety Manager for Vista Outdoor, which includes Federal Cartridge Company, a subsidiary of Vista Outdoor. My job responsibilities include investigating and undertaking root cause analysis for allegations relating to product malfunctions as well as serving as an expert in criminal matters involving ammunition. I have examined/investigated over 1,000 claims pertaining to ammunition and firearm complaints. I work closely with manufacturing, product development and quality to understand product functionality, product misuse, design objectives and design limitations. A copy of my CV is included. (Exhibit A)

During the previous 4 years, I have testified as an expert at trial in the following matters:

United States vs. Daniel Santiago; United States District Court, San Francisco, CA, August, 2013

United States vs. Hammond; United States District Court, New Haven, CT, August, 2013

United States vs. Leonard Hill; United States District Court, Minneapolis, MN, August, 2015

United States vs. Tuan Ngoc Luong; United States District Court, San Francisco, CA, September, 2015

During the previous 4 years, I have testified as an expert at depositions as follows:

Conlin, Zachary v. Magnum Research, Inc., Kahr, Inc.; Federal Cartridge Company; Outdoor Sportsman, Inc. I was deposed twice: one expert deposition and one trial deposition; Superior Court of California, County of San Joaquin, May, 2016.

Data and Facts Considered

I have reviewed:

- Pleadings filed by plaintiff and defendants;
- Plaintiff's deposition;
- Discovery demands and responses exchanged by the parties;
- Photographs;
- Tom Roster's expert report and deposition;
- Federal Cartridge Company records for any similar claim involving H121 ammunition;
- Observations and video footage from Obstruction Test including a 12/20 burst and tube separation events

Background Facts

On October 30, 2014, Mr. Barben was pheasant hunting using a Beretta Silver Pigeon II over/under shotgun and Federal Cartridge Company H121 6 Game-Shok ammunition. Upon firing his second round, the bottom barrel ruptured approximately 5" from the breech. This rupture resulted in a hand injury to Mr. Barben.

Mr. Barben's shotgun ruptured from an obstruction collision approximately two inches in front of the chamber. This is evident from the photographs showing a bulge in the barrel that propagated into a barrel rupture. Plaintiff's expert alleges that on the first shot fired during the hunt by plaintiff, a shotshell tube separation event occurred, lodging the plastic tube portion into the Beretta barrel. He alleges that a subsequent round was fired and collided with the tube, rupturing the barrel.

Observations, Testing and Analysis

To begin the investigation I analyzed Federal Cartridge Company Game-Shok H121 ammunition. H121 ammunition has been manufactured since 2002 and is loaded in 12 gauge with a 1 ounce lead payload available in shot sizes 6, 7.5 and 8. Sales history shows that during the last seven years Federal Cartridge has sold over 130 million rounds of H121 ammunition. (Exhibit B) According to my examination of the Federal Cartridge Company's database, in this time frame Federal Cartridge has received zero reports of tube separations from either internal testing or external field complaints with H121 ammunition.

Additionally, I examined the history of alleged incident lot 3V29VM259. The ballistic report for this lot was well within industry specification for pressure and velocity. See ballistic report (Exhibit C). This lot has an estimated lot size of 238,800 rounds and was manufactured on September 16, 2014. My search of Federal Cartridge Company's database resulted in zero records of any type of complaint with this lot number. In my experience, in the rare instance cutoff incidents do occur, there are hundreds of claims per lot. This clearly indicates that the H121 ammunition that plaintiff was using does not have a history of a design or manufacturing defect that would allow the tube to separate from the remainder of the shell.

According to plaintiff's expert's report, he offers the opinion that the hollow plastic hull separated from the metal head and traveled down the barrel creating an obstruction. He opines that the H121 tube separation became a sufficient obstruction capable of a blockage due to the wedging effect from the collision with the payload of the second shot. Plaintiff's expert did not conduct testing to prove or disprove his theory.

Using a Beretta Silver Pigeon I exemplar, I conducted an Obstruction Test, using a separated plastic hull. The hull had to be pounded into the barrel past the forcing cone and mechanical pressure exerted to get the hull deep enough in the barrel to allow another round to chamber behind it. A H121 round was then fired into the plastic hull. The first test resulted in the majority of the plastic hull ironing out on the inside of the barrel. A small portion of the hull fired out the muzzle and was recovered 50 yards downrange. The payload passed harmlessly through the hull leaving zero damage or bulge to the barrel.

I removed the ironed out hull and inserted another hull for the second test. The second round resulted in the payload striking the hull and firing it out of the barrel. The hull was recovered at the end of a 100 yard ballistic alley. Again, there was no firearm damage or bulge. See Obstruction Test Results. (Exhibit D)

Plaintiff's expert's opinion is based on the recovery of a tube portion of a Federal H121 6 shell recovered from the scene on June 12th, 2015, more than seven months after the incident occurred and after his initial consultation with plaintiff's counsel. The hull was allegedly found within ten yards of the incident site and missed by a previous Law Enforcement search and plaintiff's own later search of the area. Additionally, the hull shows no signs of fire damage

similar to the other hulls found during the June 3rd 2015 inspection that were in the field for a winter and the field burn. The background of this alleged hull is suspect. It is also of note that the separated head was not recovered, even after use of a metal detector.

In my 15 years of experience I have never heard of, and Federal Cartridge has never received other reports of a plastic hull obstruction resulting in firearm damage. First, the chance of getting a second round to chamber is small due to the stuck tube not traveling far enough down the barrel past the chamber to allow another round to be loaded into the chamber. Second, even if the tube traveled far enough down the barrel to allow a second round to chamber and fire, a separated tube is not a significant obstruction. The plastic tube allows the gas to pass through. A bulge or burst barrel is caused by an expansion of gas in a trapped area. A burst barrel is always from a significant obstruction, a secondary ignition down the barrel, or poor quality metal of the barrel.

The recovered hulls from the Obstruction Test are not remotely similar to the hull allegedly recovered by plaintiff. The hulls from the test show more tearing and are more deformed with minimal signs of being struck by pellets. This differs from the plaintiff's hull which Mr. Roster states "There is clear evidence of a multiplicity (~16) of melted/pressed, quite regularly spaced indents/dimples/pits into and around the circumference of the base of the plastic tube…" Shotshell pellets do not stack neatly during manufacture; also they become more randomly spaced when fired. Based on my experience, testing and condition of the hull, the hull allegedly recovered by plaintiff appears to have nothing to do with plaintiff's incident.

The combination of evidence that Federal Cartridge Company has zero history of tube separations with H121 ammunition, and the Obstruction Test conducted refuting Mr. Roster's idea of a tube separation rupturing the barrel, makes it more likely than not that the plaintiff's incident was not from a separated tube event.

Through my investigation I reviewed photographs of the shotgun and ammunition. The examination of these photographs revealed immediate similarities to a 12/20 burst incident. A 12/20 burst occurs when a 20 gauge shell is inserted into the chamber of a 12 gauge firearm. The narrower rim of the 20 gauge shell (.766") drops past the chamber and makes contact with the inside diameter of the forcing cone area of the 12 gauge barrel (.798" to .725"), just in front of the chamber. This forcing cone portion of a shotgun barrel is located approximately 3.5" from the breech.

The 20 gauge shell lodges in the barrel far enough in front of the chamber to allow a 12 gauge shell to chamber and fire behind the 20 gauge shell. Once fired, the expanding gases from the 12 gauge begin to force the 20 gauge shell down the barrel, flattening the 20 gauge rim. See photos of 20 gauge heads from 12/20 bursts. (Exhibit E)

The 12 gauge pellets collide with the 20 gauge primer and the 20 gauge shell fires outside the thicker steel chamber of the firearm. The combination of the ignition of the 20 gauge shell in

the thinner steel barrel and the collision of the 12 gauge payload can bulge or rupture the barrel.

To test this theory, using the exemplar Silver Pigeon I, I attempted to replicated a 12/20 scenario, using a high speed camera to capture the data. The test resulted in the 20 gauge shell firing just past the forcing cone area and creating a bulge in the barrel 5" from the breech. The bulge location is exactly the same distance from the breech as plaintiff's barrel rupture. See Obstruction Test Results. (Exhibit D)

My prior investigations of previous 12/20 burst incidents show the degree of barrel damage varies from bulges to ruptures. Whether a barrel bulges or ruptures depends on a variety of factors including the composition and batch to batch variation of the steel, heat treatment of the steel, variation of components in the 20 gauge shell, and the timing of the ignition of the 20 gauge shell. The constant indicators are the location of the barrel damage just past the forcing cone and the commonality of 12/20 bulges/bursts occurring in over/under shotguns. Most semi-auto and pump shotguns will not reliably cycle the 20 gauge ammunition into the chamber.

The extent of damage and location of the rupture on plaintiff's firearm are similar to a previous barrel rupture reported to Federal Cartridge Company in 2008 involving a Weatherby Over/Under shotgun. It was determined that the obstruction was a 20 gauge shell. (Exhibit F)

The combination of 20 gauge ammunition and 12 gauge firearms are a known unsafe combination. The firearms and ammunition industry warn of the consequences of these combinations and require all manufacturers to use yellow hulls for 20 gauge ammunition to avoid confusion and mixed ammunition. Federal Cartridge receives approximately one to two reports each year of a 12/20 bulges/bursts occurring in the field, and warns accordingly on the packaging. (Exhibit G)

Summary of Opinions

I intend to offer the following opinions at the trial of this matter.

Plaintiff's H121 ammunition was designed and manufactured within industry specification.

The hull allegedly found by the plaintiff was most likely not from the incident.

A tube separation event resulting in lodging a hull in the barrel is not a significant obstruction and will not result in barrel damage or barrel rupture.

Plaintiff's incident was the result of a 12/20 burst.

I reserve the ability to consider any new or additional information for purposes of supplementing this report. I also plan to evaluate and respond to any opinions tendered by other experts.

Sincerely,

Steve Rodgers

Exhibit A

Steven J. Rodgers
900 Ehlen Drive, Anoka, MN 55303
steve.rodgers@vistaoutdoor.com

Professional Experience

Vista Outdoor/ ATK/ Federal Cartridge Company
2014 – Present*: Product Safety Manager*
2013 – 2014*: Claims Specialist*
2007 – 2013*: Technical Service Specialist III*

Technical Expert
Provide detectives, investigators, crime labs, forensic labs, district attorneys, and defense attorneys with information regarding evidence recovered from crime scenes for use in investigations, litigations, affidavits, and/or trial. Contributed to more than 200 criminal cases since 2007 by providing expert technical information, including:

- Cartridge case and head stamp identification – cartridge case manufacturing process, bunter tool wear, bunter tool lifespan/rounds produced per bunter, bunter tool manufacturing process, machining and electrical discharge machining processes.
- Bullet identification – bullet manufacturing process, examine recovered bullet characteristics to determine type of projectile; provide bullet composition information.
- Shotshell component identification – shotshell wad and component identification to determine the round involved.
- Lot number information and component source identification to determine manufacture date and manufacturer location for interstate nexus.
- Sales channel, sales volume, and product distribution information to be used for product tracking.
- Ballistic expert; Provide interior, exterior, and terminal ballistics, firearm compatibility, and product usage expertise to end users including law enforcement, military, and commercial sales channels.

Provide technical information to the Central Intelligence Agency, Federal Bureau of Investigations, Bureau of Alcohol, Tobacco and Firearms, members of the Association of Firearm Tool Mark Examiners, and various local, regional, and international law enforcement agencies.

Expert Witness Testimony
Subpoenaed in criminal cases to provide expert witness testimony as a representative of industry and Vista Outdoor, on behalf of state and federal government.

State of California vs. Soto: Expert witness on bunter tool marks and cartridge case identification.

State of California vs. Lazarus: Expert witness on bullet identification and manufacturing tool marks.
United States vs. SGT. Brent Burke: Expert witness on bullet identification and channels of distribution.
United States vs. Daniel Santiago: Expert witness on bullet identification, cartridge components, and lead styphnate primers. Testified during two trials due to hung jury.
United States vs. Hammond: Expert witness on interstate nexus, firearm/ammunition compatibility, and reloading ammunition.
United States vs. Leonard Hill: Expert witness on interstate nexus, component identification, and reload identification.
United States vs. Tuan Ngoc Luong: Expert witness on interstate nexus and component identification.

In-House Expert, Litigations
Expert on examining damaged firearms and determining causes. Investigator of personal injury and product liability claims involving ammunition, firearms, optics, reloading products, holsters and shooting accessories to determine causation. Attend exhibit inspections, complete scientific testing, write expert reports or affidavits and testify at depositions or trial.

In-House Expert, Pre-Litigations
Managed property and firearm damage customer claims to determine root cause analysis and decide terms of settlement or closure for mutually beneficial outcome, as deemed necessary. Managed personal injury claims through exceptional negotiation skills to maintain customer satisfaction and to avoid escalation and/or litigation.

Product Recall Management
Manage the communication, implementation, documentation and reporting of four ammunition recalls, one firearm recall and one firearm cleaning chemical product recall.

Technical and Public Relations
Conduct 200+ tours of Federal Cartridge Company's manufacturing facility for key customers, industry personnel, law enforcement agencies, state and national dignitaries, including range time with product demonstration and shooting instruction.

2002 – 2007 *Dealer Services Representative Lead*
Instructor for hands-on range-based ammunition and reloading training for retail sales personnel at dealers, regional, and national chains that carried Federal Ammunition, RCBS reloading products, Weaver Optics, and other ATK branded shooting sports accessories.

Conducted ammunition product training, including ballistic gelatin testing, barrier testing, bullet upset, stopping power, accuracy testing and product performance and usage guidelines for new sales representatives, employees, and customers with a concentration on new product introductions, differentiation and benefits.

Directed work for a team of three Dealer Services representatives, including creating dealer promotions, managing a $1.5 million co-op advertising budget, communicating to customers, and providing retail service and support.

1993 – 1996 *Distribution/Manufacturing (Seasonal Full-time Temporary)*
Various summer temporary assignments including order fulfillment, propellant and raw material distribution, and warehouse operations.

Summit Flyfishing Company
2000 – 2002 *Store Manager and Flyfishing Guide*

Ran day-to-day operations of premiere destination flyfishing retail location, including product ordering and inventory, testing new product, providing expert advice and a distinct customer experience. Conducted day trips and weekend guided flyfishing trips for individuals and groups; taught fly casting and fly tying for novice and experienced anglers.

Minnesota Senate (2000 Legislative Session)

2000 *Committee Clerk, Transportation Committee*
Organized meetings and supporting materials for the Minnesota Senate Transportation Committee and answered constituent communications.

Education

Minnesota State University, Moorhead, MN **1999**
Bachelor of Science, University Studies-Business

Professional Certifications and Affiliations

Certified DPMS AR15 Armorer 2009
Certified Glock Armorer 2008 and 2015
Certified Defensive Edge AR15/M16/M4 Armorer 2014
Member, International Consumer Product Health and Safety Organization

Awards / Recognition

Received three ATK A3 (ATK Achievement Award) performance awards
2nd Place, 2011 Congressional Shoot, ATK Shooting Team
3rd Place, 2012 Congressional Shoot, ATK Shooting Team
2nd Place, 2014 Congressional Shoot, ATK Shooting Team
1st Place, 2016 Congressional Shoot, Vista Outdoor Shooting Team

Exhibit B

Invoice Quantity	Column Labels								
Row Labels	Calendar 2010	Calendar 2011	Calendar 2012	Calendar 2013	Calendar 2014	Calendar 2015	Calendar 2016	Calendar 2017	Grand Total
H121 6	4,530,425	5,967,450	3,592,150	3,518,150	5,070,500	3,025,500	3,954,175	1,222,300	30,880,650
H121 7.5	8,712,950	13,189,225	5,847,900	4,402,800	11,116,475	3,704,925	4,112,500	1,474,525	52,561,300
H121 8	8,646,025	10,195,150	6,292,575	3,858,425	9,079,975	4,211,450	3,305,000	1,499,025	47,087,625
Grand Total	**21,889,400**	**29,351,825**	**15,732,625**	**11,779,375**	**25,266,950**	**10,941,875**	**11,371,675**	**4,195,850**	**130,529,575**

Exhibit C

Hunstad, Wayne

From: Foster, Angela <Angela.Foster@VistaOutdoor.com>
Sent: Thursday, January 14, 2016 10:21 AM
To: Hunstad, Wayne
Subject: Test Report Request

Hi Wayne

Please send me the P&V test report and any other testing reports we have for the following lot: 3V29VM256. Product is Federal Game Shok 12 gauge, 2 ¾ #6 shot. Thanks!

2014

Sept 13th 2014 ?

Angela Foster
Paralegal
Vista Outdoor Inc.
1 Vista Way | Anoka, MN 55303
(763)712-7740
angela.foster@vistaoutdoor.com

Loader #29 had A shot change to #12/6

ON 9-14-2014 2:38 PM

(9-16-2014 40 to TG12-712 1:50 PM)

OEHLER System 82 14/09/14-02:38p SlowFire Mode

02:38p Comment: 29
SHOT CHANGE 6

Round	0 2000 5-P-Max-	0 3.000 5-Vel/TA
1	1	1260F
2	9104	1310
3	8913	1308
4	8780	1294
5	8817	1290
6	9297	1319
7	9095	1308
8	8259	1289
9	9842	1315
10	6641	1298
11	8970	13025
10 Valid Rounds		
Mean	8892	1303
Std Dev	275	10
Max	9297	1319
Min	8259	1289
Range	1039	30
Mean+3S	9717	1334
Mean-3S	8067	1272

02:39p Comment: 89 1315

LOAD H/131 6 LDR
PDWR 366 692
VEL/MEAN 1190 WGHT
WAD
SHIFT V, U, P, Q Gunner
BBL BBL CORR P V

OEHLER System 82 14/09/14-09:27p SlowFire Mode

09:27p Comment: [illegible]

Round	5-P-Max- (2000)	5-Vel/10 (3,000)
1	8444	1282F
2	8328	1288
3	9777	1298
4	8914	1300
5	8757	1298
6	8503	1321
7	9036	1306
8	8755	1301
9	9123	1308
10	8988	1294
11	8129	12695
10 Valid Rounds		
Mean	8771	1298
Std Dev	314	14
Max	9123	1321
Min	8129	1269
Fence	994	51
Mean+3S	9713	1339
Mean-3S	7829	1257

09:28p Comment: 88 1308

OEHLER System 82 14/09/15-10:07a SlowFire Mode

10:07a Comment: 29

Round	0 2000 5-P-Max-	0 3.000 5-Vel/TA
1	9026	1277F
2	9380	1268
3	9436	1289
4	8864	1269
5	8690	1285
6	8779	1276
7	8508	1247
8	9451	1280
9	8738	1254
10	8977	1277
11	9351	1286S
10 Valid Rounds		
Mean	9017	1273
Std Dev	355	14
Max	9451	1289
Min	8508	1247
Range	942	42
Mean+3S	10083	1315
Mean-3S	7951	1231

10:07a Comment: 90 1283

LOAD H121-6 LDR 29
PDWR 360-690 WGHT
VEL/MEAN 1290 WAD W9 W6
SHIFT V, U, P, Q Gunner Todd O.
BBL 31 BBL. CORR P 0 V +10

OEHLER System 82 14/09/15-04:07p SlowFire Mode

04:07p Comment: 29

Round	0 2000 5-P-Max-	0 3.000 5-Vel/TA
1	8424	1270F
2	9784	1325
3	8630	1299
4	9281	1297
5	8918	1298
6	8214	1294
7	8875	1286
8	9086	1274
9	8418	1275
10	9247	1289
11	8968	1290
12	8830	1274S
11 Valid Rounds		
Mean	8932	1291
Std Dev	431	15
Max	9784	1325
Min	8214	1274
Range	1570	51
Mean+3S	10225	1336
Mean-3S	7639	1246

04:07p Comment: 89 1301

Cut
Powder
20 mg -

OEHLER System 82 14/09/15-09:03a SlowFire Mode

09:03a Comment: LOK 29 BL 31 0 +10

Round	2000 5-P-Max-	3,000 5-Vel/FA
1	9475	1232
2	8854	1278
3	8601	1255
4	9379	1273
5	9282	1273
6	9027	1276
7	8709	1251
8	7895	1238
9	8812	1237
10	9161	1258
11	8744	12679
11 Valid Rounds		
Mean	8758	1257
Std Dev	453	16
Max	9379	1276
Min	7895	1232
Range	1484	44
Mean+3S	10117	1305
Mean-3S	7399	1209

09:05a Comment: BB 1267

OEHLER System 82 14/09/16-05:46a SlowFire Mode

05:46a Comment: LOR 29 BBL 31 0 +10

Round	0 2000 5-P-Max-	0 3,000 5-Vel/TA
1	8645	1262
2	8900	1284
3	9245	1294
4	9730	1294
5	8771	1276
6	9018	1271
7	8094	1253
8	9177	1260
9	8750	1250
10	8208	1245
11	8633	12548
11 Valid Rounds		
Mean	8834	1268
Std Dev	464	17
Max	9730	1294
Min	8094	1245
Range	1636	49
Mean+3S	10226	1321
Mean-3S	7442	1216

05:47a Comment: BB 1278

OEHLER System 82 14/09/16-10:05a SlowFire Mode

10:05a Comment: 29

Round	5-P-Max- (0 2000)	5-Vel/TA (0 3,000)
1	9141	1263F
2	8654	1257
3	8697	1267
4	8430	1250
5	9094	1253
6	8572	1244
7	8117	1232
8	8884	1240
9	8105	1241
10	8823	1259
11	8587	1240S
10 Valid Rounds		
Mean	8596	1248
Std Dev	315	11
Max	9094	1267
Min	8105	1232
Range	989	35
Mean+3S	9542	1280
Mean-3S	7650	1216

10:06a Comment: 86 1258

LOAD H121-6 LDR 29
PDWR 360-690 WGHT
VEL/MEAN 1290 WAD W9 W6
SHIFT V, U, P, Q Gunner Todd O.
BBL 31 BBL. CORR P 0 V +10

Q M258

SHIFT P

LOADING INSPECTION REPORT 9-14 20 14 CODE NO. M257

27

POWDER WEIGHT CONTROL LIMITS: "O" ± .030
"O" = 1.19-7 1.23

TIME	169	170	171	172	31	32	33	34
1								
2								
3					6/			
4								
5								
AVERAGE	120	120	1.17	117	1.23	1.22	1.23	123
RANGE	04	06	.05	06	04	03	.03	04

SHOT WEIGHT CONTROL LIMITS: 27.9-28.9
AVG. ($\bar{X}$5) = 31.1-32.6 RANGE (UCLR5) = 1.5

TIME	169	170	171	172	31	32	33	34
1								
2								
3								
4								
5								
AVERAGE	31.4	31.4	31.60	31.2	28.45	26.25	28.65	28.35
RANGE	.66	.78	.66	1.0	.70	1.38	1.22	.94

LOADER NO. 27
GAUGE 12
LOAD 3-1 1/8-7 1/2 34-1 7/8
CATALOG NO. MP127 LTLR
WADDING W9W6
POWDER 360-690

28

POWDER WEIGHT CONTROL LIMITS: "O" ± .030
"O" = 1.13

TIME	70	71		72	73	74	75	76
1								
2			?					
3			1					
4								
5								
AVERAGE	113	113		113	1.14	1.13	1.13	1.13
RANGE	06	06		06	.06	04	.02	05

SHOT WEIGHT CONTROL LIMITS:
AVG. ($\bar{X}$5) = 31.1-32.6 RANGE (UCLR5) = 1.5

TIME	70	71		72	73	74	75	76
1								
2			?					
3			1					
4								
5								
AVERAGE	31.4	31.5		30.8	31.4	31.73	32.11	32.25
RANGE	.80	.53		.78	.64	.53	.72	.82

LOADER NO. 28
GAUGE 12
LOAD 2 3/4-1 1/8-8
CATALOG NO. TGL12F
WADDING W9W6
POWDER 360-690

29

POWDER WEIGHT CONTROL LIMITS: "O" ± .030
"O" = 1.24 121

TIME	35	39		40	41	42		
1			?					
2								
3								
4								
5								
AVERAGE	122	121		124	.123	1.22		
RANGE	06	.05		05	.06	04		

SHOT WEIGHT CONTROL LIMITS
AVG. ($\bar{X}$5) = 27.9-28.9 RANGE (UCLR5) = 1.5

TIME	35	39		40	41	42		
1			?	s/c				
2			,					
3								
4								
5								
AVERAGE	28.3	28.2		27.5	29.0	28.7		
RANGE	.39	.66		.46	1.32	.48		

LOADER NO. 29
GAUGE 12
LOAD 2 3/4-1-7.5 6
CATALOG NO. H121
WADDING W9W6
POWDER 360-690

POWDER WEIGHT CONTROL LIMITS: "O" ±
"O" =

TIME								
1								
2								

SHOT WEIGHT CONTROL LIMITS:
AVG. ($\bar{X}$5) = RANGE (UCLR5) =

TIME								
1								
2								

LOADER NO.
GAUGE
LOAD

MONDAY / TUESDAY

SHIFT V/U

LOADING INSPECTION REPORT

9-16-2014 UM259
9-15-2014 CODE NO. VM258

27

POWDER WEIGHT CONTROL LIMITS: "O" = 1.23 "O" ± .030

TIME	35		36	37		38	39	31
1	Tare		Tare	Tare				
2		?						
3								
4								
5								
AVERAGE	1.24		1.25	1.24		1.23	1.25	1.25
RANGE	.04		.04	.03		.04	.06	.04

SHOT WEIGHT CONTROL LIMITS:
AVG. (X̄5) = 27.9 - 28.9 RANGE (UCLR5) = 1.5

TIME	35		36	37		38	34	31
1	Tare		Tare	Tare				
2		?						
3				NEW				
4				PIN				
5								
AVERAGE	28.34		27.86	27.23		28.16	28.71	28.57
RANGE	.86		.91	.87		1.10	1.06	1.09

LOADER NO. 27
GAUGE 12
LOAD 3¼-1-7½
CATALOG NO. GTL12
WADDING W9 W6
POWDER 360-690

28

POWDER WEIGHT CONTROL LIMITS: "O" = 1.13 > 1.16 "O" ± .030

TIME				77	31	32	33	34
1				Tare				
2	D	D	D		C/O			
3	O	O	O					
4	W	W	W					
5	N	N	N					
AVERAGE				1.13	1.16	1.16	1.15	1.16
RANGE				.04	.04	.05	.05	.04

SHOT WEIGHT CONTROL LIMITS:
AVG. (X̄5) = 31.1 - 32.6 RANGE (UCLR5) = 1.5

TIME				77	31	32	33	34
1				Tare				
2	D	D	D		C/O			
3	O	O	O					
4	W	W	W					
5	N	N	N					
AVERAGE				32.20	31.86	31.73	31.99	32.20
RANGE				.44	1.11	.52	.91	.98

LOADER NO. 28
GAUGE 12
LOAD 2¾-1⅛-8 > 3-1⅛-8
CATALOG NO. TGL12P > 5510
WADDING W9 W6
POWDER 360-690

29

POWDER WEIGHT CONTROL LIMITS: "O" = ~~1.22~~ → 1.23 "O" ± .030

TIME	43		44	45	46	47	48	49
1	Tare		Tare	Tare				
2		?						
3								
4		-						
5								
AVERAGE	1.24		1.25	1.23	1.23	1.23	1.22	1.23
RANGE	.06		.05	.06	.04	.05	.06	.06

SHOT WEIGHT CONTROL LIMITS:
AVG. (X̄5) = 27.9 - 28.9 RANGE (UCLR5) = 1.5

TIME	43		44	45	46	47	48	49
1	Tare		Tare	Tare				
2		?						
3								
4		-						
5								
AVERAGE	28.97		28.30	28.18	28.18	27.88	29.16	28.30
RANGE	.93		.79	.81	.84	.90	.67	1.41

LOADER NO. 29
GAUGE 12
LOAD 2¾" - 1-6
CATALOG NO. H121
WADDING W9 W6
POWDER 360-690

POWDER WEIGHT CONTROL LIMITS: "O" = "O" ± _____

TIME									
1									
2									
3									

SHOT WEIGHT CONTROL LIMITS:
AVG. (X̄5) = RANGE (UCLR5) =

TIME									
1									
2									
3									

LOADER NO. _____
GAUGE _____
LOAD _____
CATALOG NO. _____

TUESDAY / WEDNESDAY

SHIFT V/U

LOADING INSPECTION REPORT

9-17-2014 UM260

9-16-2014 CODE NO. VM259

27

POWDER WEIGHT CONTROL LIMITS: "O" = 1.24 "O" ± .030

TIME	32	31	32	33	34
1	T.H.D.		T.H.D.	T.H.D.	
2			SHOT		
3			C/O		
4					
5					
AVERAGE	1.23	1.26	1.24	1.23	1.23
RANGE	.06	03	.03	.05	.03

SHOT WEIGHT CONTROL LIMITS: AVG. (X5) = 27.9-28.9 RANGE (UCLR5) = 1.5

TIME	32	31	32	33	34
1	T.H.D.		T.H.D.	T.H.D.	
2			SHOT		
3			C/O		
4					
5					
AVERAGE	28.82	28.3	28.33	27.73	28.69
RANGE	.86	.79	1.05	.66	1.15

LOADER NO. 27

GAUGE 12

LOAD 3¼-1-7½ > -6

CATALOG NO. GTL12

WADDING W9 W6

POWDER 360-690

28

POWDER WEIGHT CONTROL LIMITS: "O" = ~~1.16~~ > ~~1.14~~ > 1.12 "O" ± .030

TIME	35	31	32	33	34	35	36	37
1	T.H.D.		T.H.D.	T.H.D.				
2								
3								
4								
5								
AVERAGE	1.15	1.15	1.14	1.12	1.10	1.13	1.12	1.12
RANGE	.04	.05	.06	.05	.05	.06	.05	.05

SHOT WEIGHT CONTROL LIMITS: AVG. (X5) = 31.1-32.6 RANGE (UCLR5) = 1.5

TIME	35	31	32	33	34	35	36	37
1	T.H.D.		T.H.D.	T.H.D.				
2								
3				NEW				
4				BIN				
5								
AVERAGE	32.26	32.3	31.82	31.44	31.16	31.90	32.05	31.94
RANGE	.76	.94	.50	.96	1.1	.58	.56	.62

LOADER NO. 28

202 PRIMERS

GAUGE 12

LOAD 3-1⅛-8

CATALOG NO. SS12H

WADDING W9 W6

POWDER 360-690

29

POWDER WEIGHT CONTROL LIMITS: "O" = 1.23 > 1.05 "O" ± .030

TIME	50		31		32	33	34	35
1	T.H.D.		T.H.D.					
2		LOAD		D				
3		C/O		O				
4		D		W				
5		O		N				
AVERAGE	1.22	W N	1.05		1.04	1.04	1.03	1.05
RANGE	.04		.05		.05	.05	.02	.06

SHOT WEIGHT CONTROL LIMITS: AVG. (X5) = 27.9-28.9 RANGE (UCLR5) = 1.5

TIME	50		31		32	33	34	35
1	T.H.D.		T.H.D.					
2		LOAD		D				
3		C/O		O				
4		D		W				
5		6		N				
AVERAGE	28.36	W N	29.64		28.40	28.75	29.08	28.88
RANGE	.67		.60		.78	.72	.58	.66

LOADER NO. 29

GAUGE 12

LOAD 2¾"-1-6 > 2¾"-1-7½

CATALOG NO. H12 > TG121

WADDING W9 W6

POWDER 360-690 > SS255-666

POWDER WEIGHT CONTROL LIMITS: "O" = "O" ± _____

TIME									
1									
2									
3									

SHOT WEIGHT CONTROL LIMITS: AVG. (X5) = RANGE (UCLR5) =

TIME									
1									
2									
3									

LOADER NO. _____

GAUGE _____

LOAD _____

Exhibit D

VISTA OUTDOOR

Obstruction Test Protocol -April 6th, 2017

1. INTRODUCTION

This testing will characterize two types of obstructions located in the forcing cone area of a shotgun barrel and subsequently firing a live round into each obstruction. The first obstruction test will use a fired 12ga hull (cut off) from load H121 6. The second obstruction will be a 20ga loaded round, load H202 6 to duplicate a 12/20 burst.

1.1 Test Equipment

12 gauge H121 6 ammunition lot number 1V27UK265, ballistics (Exhibit 1)
20 gauge H200 6 ammunition lot number 7P24PK331, ballistics (Exhibit 2)
12 gauge H121 6 fired hull lot number 1V27UK265, tube cut from metal head.
Exemplar Beretta O/U Silver Pigeon I serial # UO7577S
Gun rest
High speed video camera (with necessary lighting & laptop)
Standard camera

1.2 Testing Procedures

An initial round of new production ammunition will be fired to test that the high speed camera is operating correctly. To create the tube separation test, I will tap a fired hull into the forcing cone area of the bottom barrel using a dowel. To create the 12/20 burst test a 20 gauge round will be dropped into the barrel.

All testing will be performed in compliance with QA safety SOPs. A lanyard and shield are to be used during all test phases where applicable. Substitution of a face shield and glove are permitted when necessary.

1.3 Record Keeping

High speed video will be taken during each round fired. Each spent cartridge will be collected, bagged and marked. Each obstruction and remaining pieces will be collected, bagged and marked.

1.4 Observations

Tube separation test results-

- Test one- 12 gauge payload passed through the lodged tube. Small portion of tube fired out the muzzle and recovered 50 yards down range,

the remainder was ironed out on the inside of the barrel. See tube photo (Exhibit 3). No barrel damage. Video- separation test one.

- Test two- 12 gauge payload collided with the lodged tube and shot it out the barrel. Tube pieces recovered at the end of the 100 yard ballistic alley. See tube photo (Exhibit 4). No barrel damage. Video- separation test two.

12/20 burst test results-

- Test one- 12 gauge round collided and ignited the 20 gauge obstruction. A ring bulge expanded in the barrel 5" from the breech. See photo (Exhibit 5). Video- 1220 obstruction.

Exhibit 1

VISTA OUTDOOR

Ballistics Velocity & Pressure Summary
Tech Services

Assembly Area: QA - SS Ballistics

Lot #: 1V27UK265

Product: H121 6 - 12 GA GAME LOAD
Correction Desc: SS Alley 4 Coils - Lead Shot
Barrel: 1201A
Type: Transducer
Chamber Transducer: 1870
Offset: 0
Velocity Correction: 20
Pressure Correction: 0
Sensitivity: 0.124
Case Type: Federal-2 3/4" - Plastic
Range Multiplier: 2000
Case Material: Plastic
Load Line: Ldr 27
Target Velocity (Hi): 1290
Target Velocity (Lo): 1290
Powder Type: 1292 ALLIANT
Employee: Hunstad, Wayne
Powder Lot: 123
Test Type: Product Evaluation
Powder Weight: 1.23
Time of Test: 4/5/2017 12:21:14 PM
Wadding: W9
Pouch: W6
Test Station: Shotshell #4

Comments:
PRE-TEST COMMENT: LOADER 27 H121-6 DATE CODE 1V27UK265

Date/Time:
4/5/2017 12:24:39 PM

VISTA OUTDOOR

Lot #: 1V27UK265

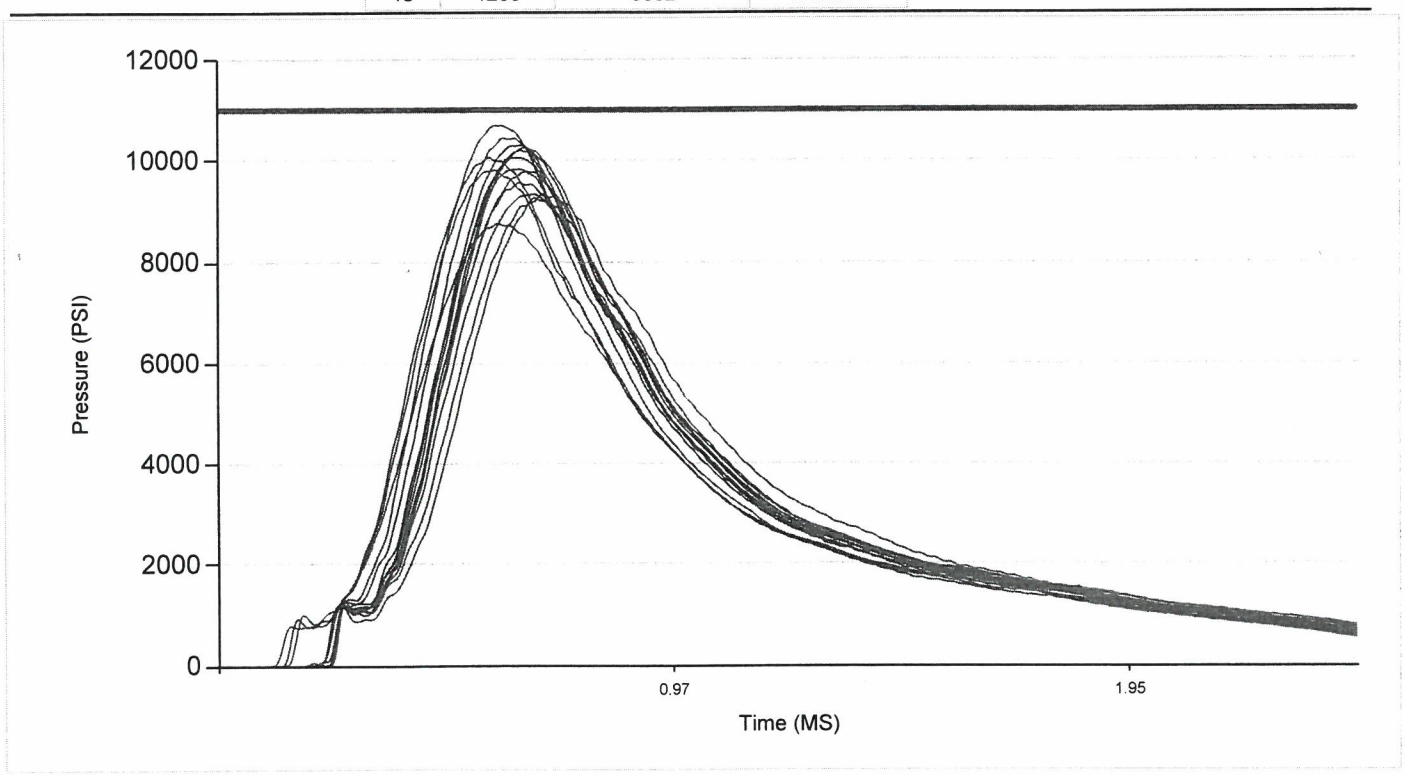
Product: H121 6 - 12 GA GAME LOAD

Ballistics Velocity & Pressure Summary
Tech Services

	Velocity	Chamber Pressure
Avg(x̄):	1279	9848
Std Dev(σ):	17	521
Max:	1305	10695
Min:	1249	8757
Range:	56	1938
x̄ + 3σ :	1330	11412
x̄ - 3σ :	1228	8284

Manual Entry ~~Round Omitted~~

Rnd	Velocity	Chamber Pressure	Chamber TTP
1	1271	9339	0.68848
2	1287	10210	0.63965
3	1289	10054	0.62988
4	1295	10695	0.59082
5	1287	10448	0.60547
6	1249	8757	0.59570
7	1271	9813	0.58594
8	1303	10301	0.64453
9	1259	9784	0.65430
10	1276	9262	0.67383
11	1295	10256	0.64941
12	1256	9337	0.66895
13	1274	9568	0.63965
14	1305	10062	0.57617
15	1269	9832	0.63965



Date/Time:
4/5/2017 12:24:39 PM

Exhibit 2

VISTA OUTDOOR

Ballistics Velocity & Pressure Summary
Tech Services

Assembly Area: QA - SS Ballistics

Lot #: 7P24PK331

Product: H200 6 - 20 GA GAME LOAD
Correction Desc: SS Alley 4 Coils - Lead Shot
Barrel: 19
Type: Transducer
Chamber Transducer: 1765
Offset: 0
Velocity Correction: 20
Pressure Correction: -400
Sensitivity: 0.137
Case Type: Federal-2 3/4" - Plastic
Range Multiplier: 2000
Case Material: Plastic
Load Line: Ldr 24
Target Velocity (Hi): 1210
Target Velocity (Lo): 1210
Powder Type: 1292 ALLIANT
Employee: Hunstad, Wayne
Powder Lot: 123
Test Type: Product Evaluation
Powder Weight: 1.23
Time of Test: 4/5/2017 12:28:45 PM
Wadding: W9
Pouch: W6
Test Station: Shotshell #4

Comments:
PRE-TEST COMMENT: LOADER 24 H200-6 7P24PK331

	Velocity	Chamber Pressure
Avg(x̄):	1212	10859
Std Dev(σ):	19	542
Max:	1249	12111
Min:	1186	10007
Range:	63	2104
x̄ + 3σ :	1270	12485
x̄ - 3σ :	1153	9234

Manual Entry ~~Round Omitted~~

Rnd	Velocity	Chamber Pressure	Chamber TTP
1	1193	10778	0.62012
2	1222	10952	0.62012
3	1186	10495	0.62012
4	1213	11244	0.61035
5	1249	12111	0.61035
6	1211	10679	0.62500
7	1232	10795	0.62012
8	1195	10007	0.67383
9	1215	10769	0.60547
10	1199	10764	0.63477

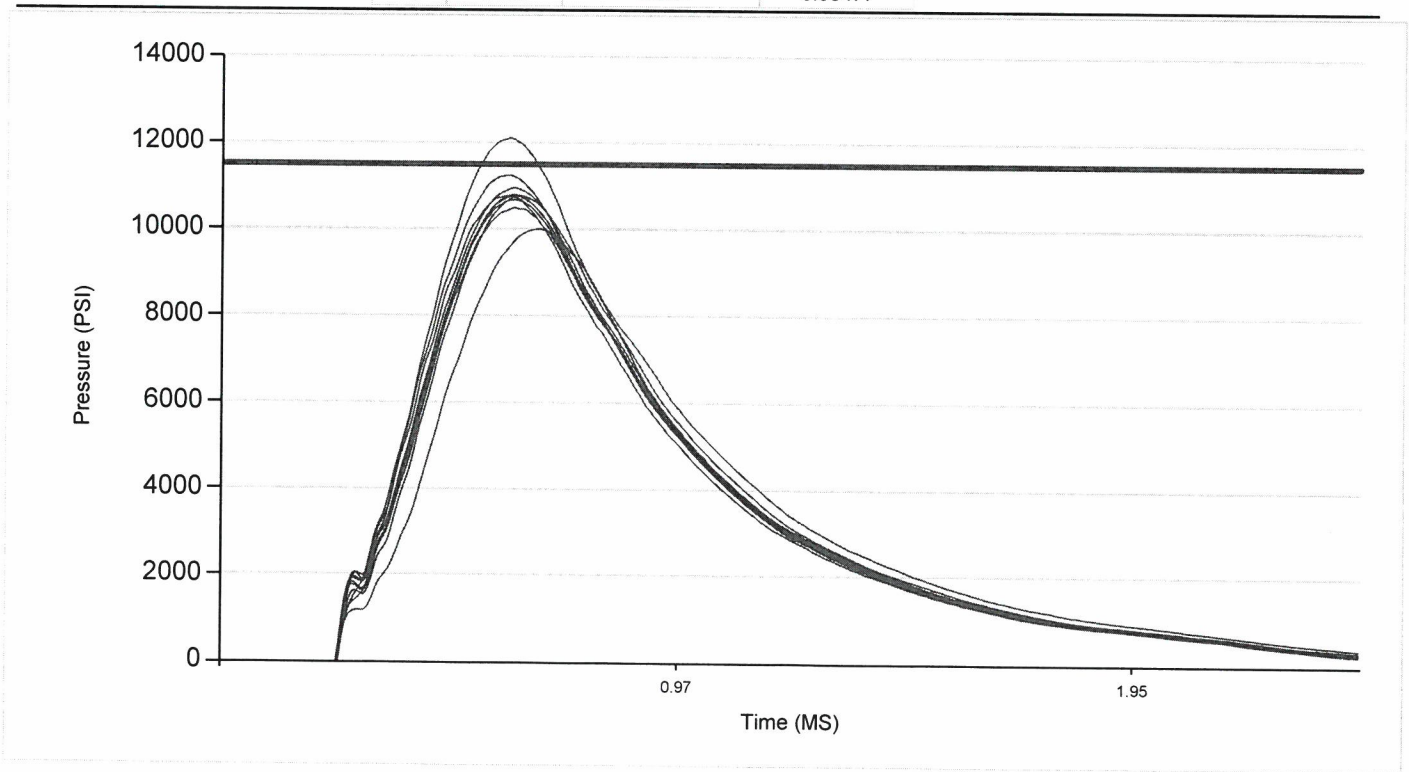


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Exhibit 3

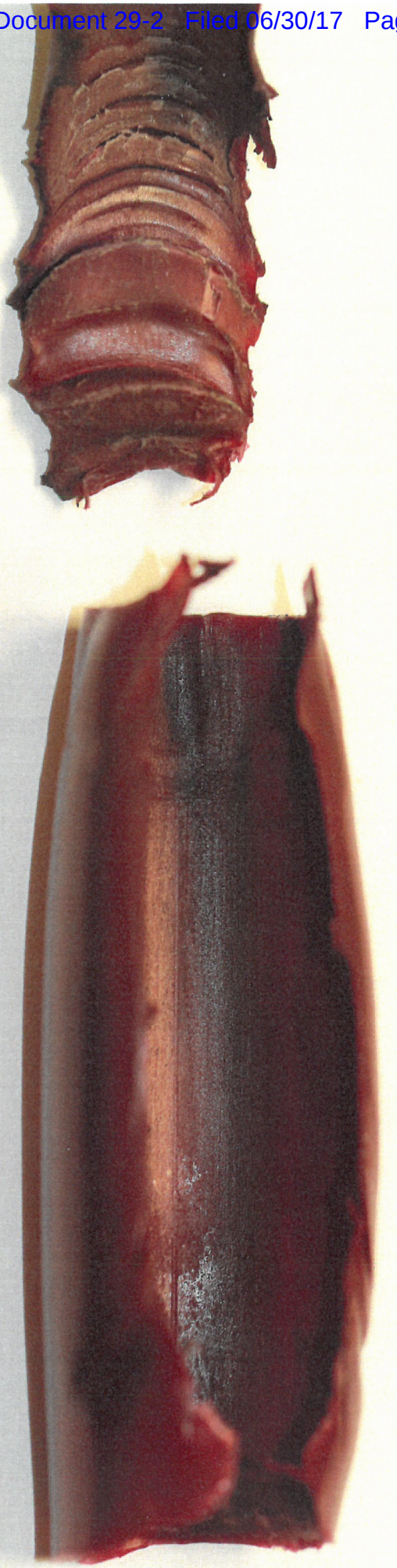

Exhibit 4

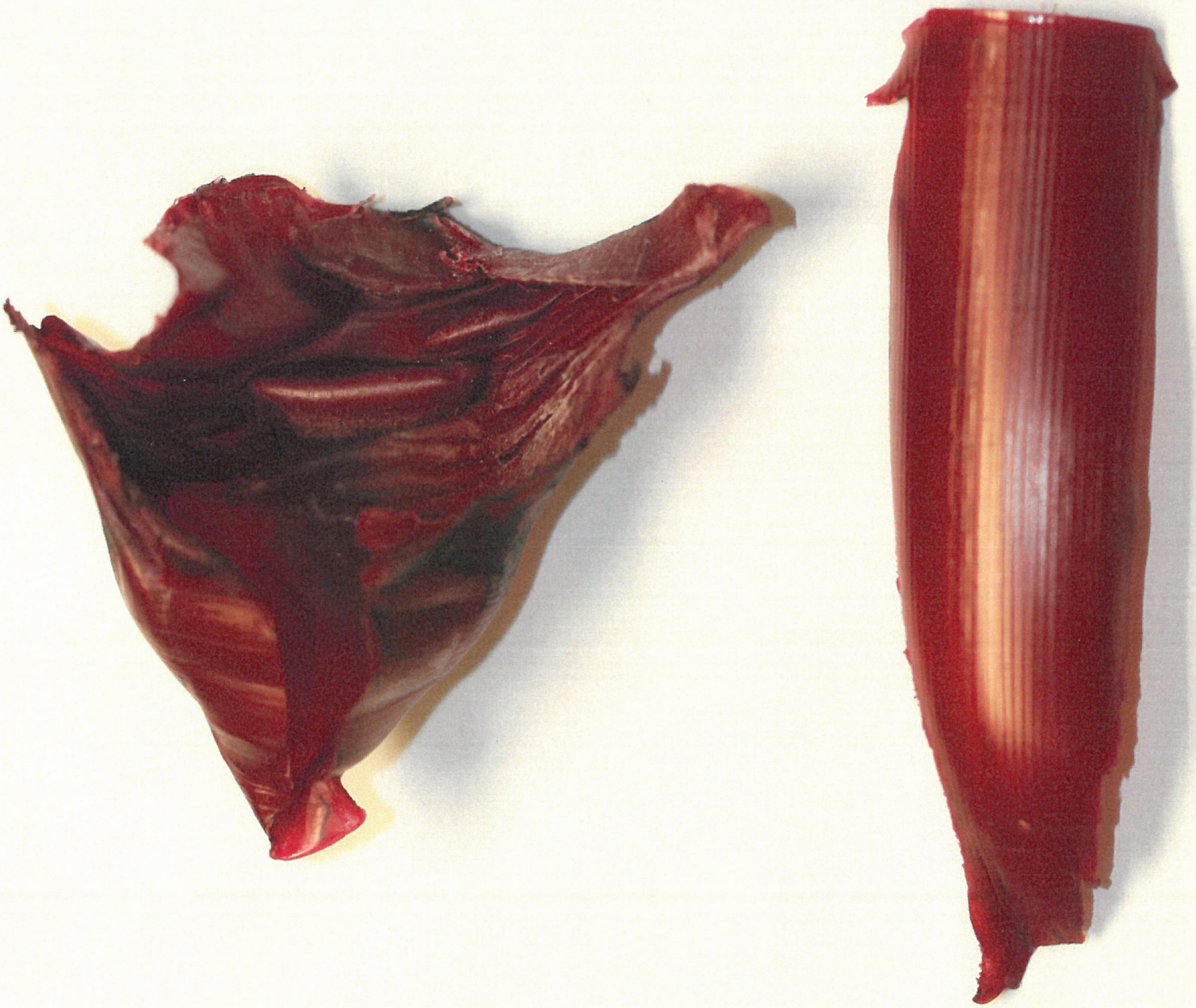

Exhibit 5

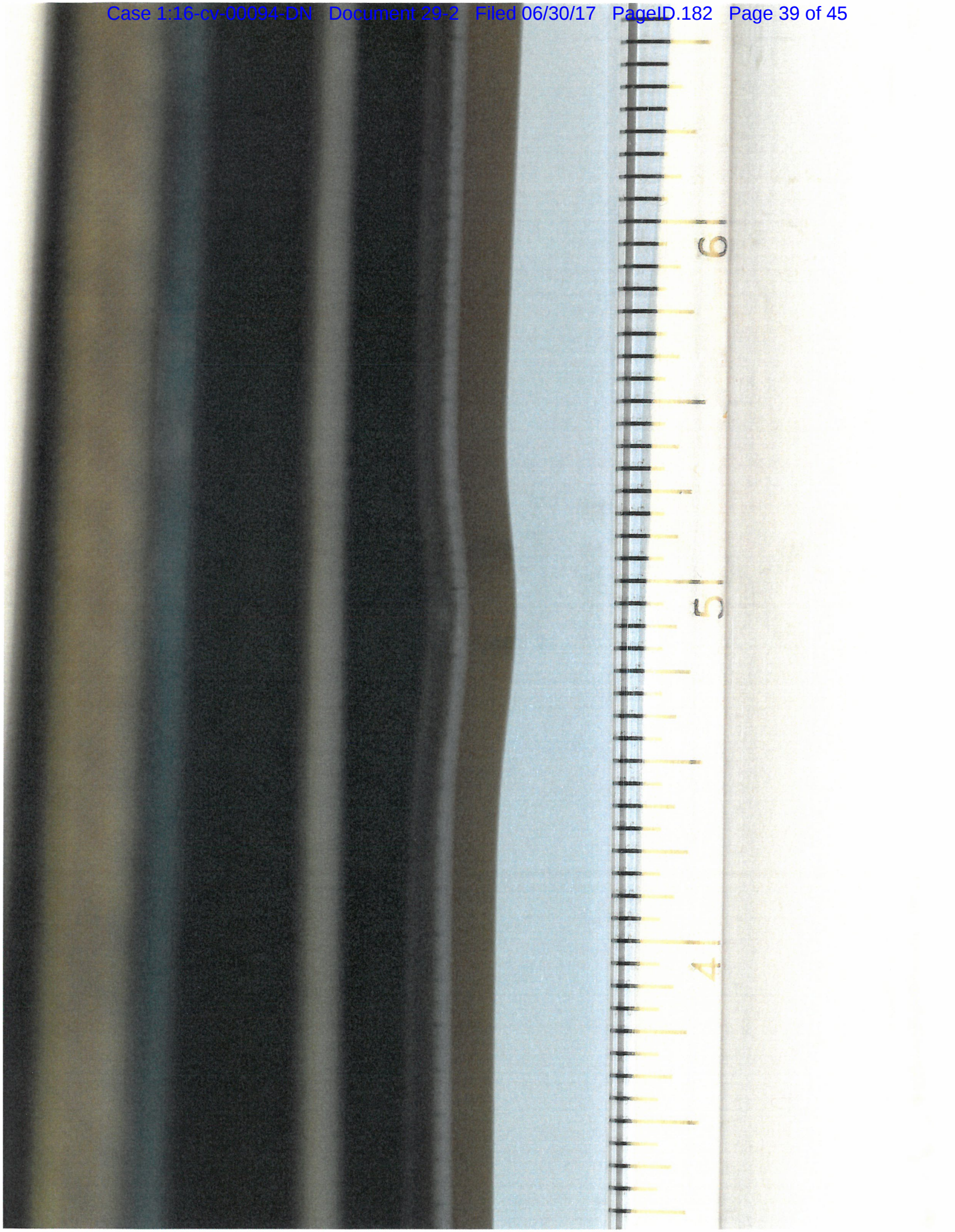
6
5
4

Exhibit E

Exhibit F

Exhibit G

WARNING: To avoid serious injury: (1) use only ammunition in good condition; use only in modern firearms in good condition marked for use of this gauge and length shotshell; (2) always be sure barrel is free of any obstructions; the barrel should be checked in case of light recoil, or an unusually loud or weak sound heard during firing; (3) wear eye and ear protection; (4) if gun fails to fire, avoid exposure to breech when unloading and point muzzle in a safe direction; keep firearm pointed in safe direction at all times; (5) discharge may occur if primer is struck; handle with caution, do not drop; (6) do not use these shells in guns with Damascus or twist steel barrels; (7) do not shoot at hard surfaces or water; lead shot may ricochet; (8) store in cool dry place; do not submerge in water; (9) be careful when eating game, do not ingest lead; lead shot may cause tooth damage; (10) since reloading practices are beyond our control, we disclaim all liability for damage or injury that may result.